

What is claimed is:

1. An operation control device for a cooling apparatus provided with a refrigerating cycle including a compressor driven by a speed-controlled electric motor and an evaporator that cools the inside of a storehouse by heat-exchange with a refrigerant discharged from the compressor comprising:

physical quantity detecting means for detecting physical quantity that directly or indirectly represents a temperature in the storehouse;

inside temperature controlling means for controlling a rotational speed of the electric motor in accordance with the detected physical quantity to thereby keep the temperature in the storehouse to a desired preset temperature; and

rotational speed restricting means for restricting the rotational speed of the electric motor to a value not more than a predetermined rotational speed when the detected physical quantity represents the inside temperature that is not less than a predetermined temperature higher than the preset temperature.

2. An operation control device for a cooling apparatus claimed in Claim 1, wherein

the cooling apparatus is applied to a refrigerator.

3. An operation control device for a cooling apparatus claimed in Claim 1, wherein

the cooling apparatus is applied to a freezer.

4. An operation control device for a cooling apparatus claimed in Claim 1, wherein  
the physical quantity detecting means is configured by a temperature sensor that is provided in the storehouse for detecting a temperature in the storehouse.
5. An operation control device for a cooling apparatus claimed in Claim 1, wherein  
the physical quantity detecting means is configured by a temperature sensor that is provided in a path of cooling air, that is cooled by the evaporator and cools the inside of the storehouse, for detecting the temperature of the cooling air.
6. An operation control device for a cooling apparatus claimed in Claim 1, wherein  
the physical quantity detecting means is configured by a temperature sensor that is installed to the evaporator for detecting the temperature of the evaporator.
7. An operation control device for a cooling apparatus claimed in Claim 6, wherein  
the temperature sensor is disposed to a position rearward from the center of the evaporator.
8. An operation control device for a cooling apparatus claimed in

Claim 1, wherein

the physical quantity detecting means is configured by a pressure sensor that is provided at a refrigerant path between the evaporator and the compressor for detecting the pressure of the refrigerant flowing through the refrigerant path.

9. An operation control device for a cooling apparatus claimed in Claim 1, wherein

the inside temperature controlling means is configured to control the rotational speed of the electric motor such that it is increased as the detected physical quantity represents a great temperature difference between the inside temperature and the preset temperature, and

the rotational speed restricting means is configured to control the rotational speed of the electric motor based upon the detected physical quantity, regardless of the preset temperature.

10. An operation control device for a cooling apparatus claimed in Claim 9, wherein

plural areas are defined in advance that are classified by the magnitude of the temperature difference between the inside temperature and the preset temperature, whereby the inside temperature controlling means controls the rotational speed of the electric motor to be different every area in which the temperature difference is placed.

11. An operation control device for a cooling apparatus claimed in Claim 9, wherein

a function or table is prepared in advance that shows a relationship between the rotational speed and the temperature difference determining that the rotational speed of the electric motor is increased as the temperature difference becomes great, whereby the inside temperature controlling means controls the rotational speed of the electric motor by using the function or table.

12. An operation control device for a cooling apparatus claimed in Claim 1, wherein

the rotational speed restricting means is provided with rotational speed change controlling means for controlling the rotational speed of the electric motor such that it is increased as the detected physical quantity represents a lower inside temperature.

13. An operation control device for a cooling apparatus claimed in Claim 12, wherein

plural areas are defined in advance that are classified by the inside temperature, whereby the rotational speed change controlling means controls the rotational speed of the electric motor to be increased as the detected physical quantity represents the inside temperature that belongs to the area where the inside temperature is low.

14. An operation control device for a cooling apparatus claimed in Claim 12, wherein

a function or table is prepared in advance that shows a relationship between the rotational speed and the inside temperature determining that

the rotational speed of the electric motor is increased as the inside temperature becomes low, whereby the rotational speed change controlling means controls the rotational speed of the electric motor by using the function or table.

15. An operation control device for a cooling apparatus claimed in Claim 1, wherein

the rotational speed restricting means restricts the rotational speed of the electric motor to a speed not more than the rotational speed corresponding to rated current flowing through the electric motor at the maximum cooling ability required for a normal operation.

16. An operation control method for a cooling apparatus provided with a refrigerating cycle including a compressor driven by a speed-controlled electric motor and an evaporator that cools the inside of a storehouse by heat-exchange with a refrigerant discharged from the compressor including:

a physical quantity inputting step for inputting physical quantity that directly or indirectly represents a temperature in the storehouse;

an inside temperature controlling step for controlling a rotational speed of the electric motor in accordance with the inputted physical quantity to thereby keep the temperature in the storehouse to a desired preset temperature; and

a rotational speed restricting step for restricting the rotational speed of the electric motor to a value not more than a predetermined rotational speed when the inputted physical quantity represents the inside temperature that is not less than a predetermined temperature higher than the preset

temperature.

17. An operation control method for a cooling apparatus claimed in Claim 16, wherein

the inside temperature controlling step controls the rotational speed of the electric motor such that it is increased as the inputted physical quantity represents a great temperature difference between the inside temperature and the preset temperature, and

the rotational speed restricting step controls the rotational speed of the electric motor based upon the inputted physical quantity, regardless of the preset temperature.

18. An operation control method for a cooling apparatus claimed in Claim 16, wherein

the rotational speed restricting step controls the rotational speed of the electric motor such that it is increased as the inputted physical quantity represents a lower inside temperature.

19. An operation control method for a cooling apparatus claimed in Claim 16, wherein

the rotational speed restricting step restricts the rotational speed of the electric motor to a speed not more than the rotational speed corresponding to rated current flowing through the electric motor at the maximum cooling ability required for a normal operation.